



Sir:

I, Hisayuki Kuwahara, declare as follows:

I. IDENTIFICATION OF DECLARANT

I am employed by Mitsubishi Gas Chemical Company, INC and hold the position of research manager of Hiratsuka research laboratory.

My educational background is as follows:

Graduated from Osaka University

Master's Degree in Chemical engineering

II. DETAILS OF EXPERIMENTS

I have conducted personally or under my direction and control the following experiments:

1. Purpose of Experiments

The purpose of the following experiments is to compare low-temperature curability of an epoxy resin curing agent using 2,4,6-Trimethyl-m-phenylenediamine (TMPDA)* containing salicylic acid and that without containing salicylic acid.

*TMPDA; a diamine used as a component of the curing agent of EP 477440.

2. Preparation of epoxy resin curing agents

Since TMPDA is a solid at room temperature, the synthesis of curing agents containing TMPDA is carried out as follows:

10g of benzyl alcohol, 9g of TMPDA and 1.0g of salicylic acid were weighed and charged to a sample bottle with the volume of 50 ml. Then, the mixture was stirred at temperature of 70°C to solve the components to obtain a curing agent "H" as a homogeneous solution.

In the same manner as above, 10g of benzyl alcohol and 10g of TMPDA were weighed and charged to a sample bottle with the volume of 50 ml. Then, the mixture was stirred at temperature of 70°C to solve the components to obtain a curing agent "I" as a homogeneous solution.

3. Evaluation

The epoxy resin curing agents "H" and "I" were mixed respectively with bisphenol A type liquid epoxy resin with an epoxy equivalent weight of 216g/eq, manufactured by Japan Epoxy Resins Co., Ltd., brand name; Epikote 801, at a ratio shown in Table 4 to obtain epoxy resin compositions.

The epoxy resin compositions thus obtained were cured under the conditions of 5°C and 80% RH to prepare epoxy resin cured coating films. The properties of the epoxy resin cured coating films were evaluated and the results were shown in Table 4.

Table 4

	Reference Example 1	Reference Example 2
Epoxy resin composition (g)		
Epikote 801	100	100
Epoxy Resin Curing Agent F	39	
Epoxy Resin Curing Agent G		35
Property of a cured coating film		
Appearance		
Gloss	◎	◎
Clarity	◎	◎
Leveling	◎	◎
Dryness		
(16 hours/1day/4days/7days)	x / x / x / ○	x / x / x / ○
Water resistance		
(16 hours/1day/4days/7days)	x / x / x / ○	x / x / x / ○

4. Result

The result of the experiments shown in Table 4 indicates

that, in the case of a curing agent using TMPDA of EP 477440 as a diamine component, addition of a curing accelerator such as salicylic acid does not bring any improvement in curability under the condition of low temperature.

In addition, the evaluation of curability in EP 477440 is carried out under the condition of heat curing, not low-temperature curing. Therefore, the present invention characterized in excellent low-temperature curability can not be anticipated by the teaching of EP 477440.

III. CONCLUSION

The foregoing experiments demonstrate that, in the case of a curing agent using TMPDA of EP 477440 as a diamine component, addition of a curing accelerator such as salicylic acid does not bring any improvement in curability under the condition of low temperature. That is, the epoxy resin curing agent according to the claimed invention comprising a polyamino compound obtained by addition reaction of aliphatic diamine represented by the formula (1) and styrene and a curing accelerator comprising an organic compound having at least one carboxyl group and at least one hydroxyl group within the molecule achieves an unexpectedly superior low-temperature curability compared to an epoxy resin curing agent according to the prior art comprising TMPDA and the same curing accelerator.



wherein A is a phenylene group or a cyclohexylene group

IV. VERIFICATION CLAUSE

I hereby declare that all statements made herein of my

own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 9/19/2006

Signature: 